3rd International Conference on Current Problems in Nuclear Physics and Atomic Energy, NPAE 2010 - Proceedings, 2011, pages 584-588

Mössbauer spectroscopy of ferromagnets in radio-frequency magnetic field

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Abstract

We considered the transmission of Mössbauer radiation through a soft ferromagnetic crystal placed in the radio-frequency (rf) magnetic field, which gives rise to periodical reversals of the magnetization of the crystal. The dynamical scattering theory is presented. The energy distribution of γ rays, transmitted through a crystal FeBO3 in the rf field, is measured experimentally. The data coincide with our calculations. It is shown that the spectrum of these γ rays consists of equidistant lines spaced by twice the frequency of the applied rf field in contrast with well-known absorption spectra. This effect results from the interference of transition nuclear amplitudes.